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Design of Standards for Nondestructive Assay of Special Nuclear Materials

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Abstract

Techniques for the nondestructive assay (NDA) of special nuclear material (SNM) involve a wide range of measurement techniques, instruments, and types of nuclear materials. The required high quality of these measurements for an effective safeguards measurement program results in the need for well-characterized SNM standards that represent the expected range of mass, chemical composition, and physical properties of the SNM to be measured. Due to the very limited commercial availability of NDA standards that represent all types of SNM, facilities need to establish the capacity to produce their own standards that meet their specific measurement needs. Our paper will describe the current extent to which NDA standards are commercially available. We will further describe the types of NDA standards used to calibrate and verify the measurement techniques commonly used in the safeguards of SNM. Several types of NDA standards will be discussed in detail to illustrate the considerations that go into specifying the designing traceable, representative standards for materials accounting measurements.

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